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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,913	10/23/2001	Makoto Kitabatake	10873.830US01	8598

7590

05/08/2003

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EXAMINER

ABRAHAM, FETSUM

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 05/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/002,913	Applicant(s) KITABATAKE, MAKOTO	
	Examiner Fetsum Abraham	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on amt A.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-12 and 14-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12 and 14-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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**Claims rejection**

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 5 recites the limitation "the gate" in claim 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 further states that the gate of the transistor is in contact with the second conductivity type semiconductor layer which means, the P-type channel layer (13 or 23) in the drawings. This structure, however, contradicts with the basic structure of transistors since a gate in contact with the channel can not have transistor action that modulates charges by field effect means.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 1-4,7-12,14-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ueno (5,693,569).

As for claims 1,8,12,20,21,22 the patent discloses a SiC based transistor in the front page composed of source (4), source electrode (8), both elements on the first substrate surface, a drain (1) and drain electrode (9) on the second surface, a first conductivity type (n) semiconductor that includes a first conductivity type region (2), a schottky diode formed by contact between the first conductivity type semiconductor (2) and a metal electrode (21), the overall semiconductor body represented by the SiC substrate (1) and epitaxially grown SiC drift layer (2), and second conductivity type base layer (3). Although the way the inherent depletion layers are not disclosed by the patent, it would have been obvious to one skilled in the art to conclude depletion width from the PN junction associated with layers (2 and 3) and that of the schottky diode since depletion is unavoidable in any PN junction that is reverse biased or in floating condition. In this case, the locations of the PN junction and the schottky diode inherently impose superimposed depletion layers similar to the claimed invention either by default or by inference due to device similarity with the claimed invention.

As for claims 2,3,9,10 all elements including gate insulated transistor in the claim are present in the prior art including a space in the body for multiple transistor formation. The fact that the structure doesn't have definite side ends means that the layers are continuous for more devices to be formed. Besides, forming multiple devices on a given body is normal practice in IC

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fabrication in order to save material, processing time, and processing steps. In other words, the claimed multiple transistors are duplicates of the one transistor in the prior art.

As for claim 4, the recess penetrates the source (4), the second conductivity type base (3) and deeper into the drift region (2). The source electrode and the shottky electrode locations are also in the exact claimed locations.

As for claims 7,14, the patent does not discriminate any type of SiC material, thus is inclusive to all types of the same.

As for claim 11, all claimed elements including the source electrode being in contact with the source region and the base region are in the prior art

As for claims 15,16,18 channel in the prior art is formed in the claimed direction and the recess surface is partially insulated by the gate insulator (6)

As for claim 19, the description of conductivity types with the claimed layers directly applies to the structure in the patent.

Any inquiry concerning this communication should be directed to Fetsum Abraham at telephone number (703) 305,3793, or by E-mail at [fetsum.abraham@uspto.gov](mailto:fetsum.abraham@uspto.gov).

Any inquiry of a general nature or relating to the status of this application should be directed to the **SPE of AU:2826** at (703)308-6601, or the **Group receptionist** at (703) 308-0956.



Fetsum Abraham/5/1/03